**Conclusions:** RVP-induced dyssynchronous heart failure could aggravate fibrosis due to regional heterogeneity of mechanical stress, and it could be partly attenuated by BiVP, in which mechanical stress-induced EndMT might play pivotal role through integrin $\beta_1$ pathway.

### GW25-e5212

### Lipoxin A4 inhibits lipid uptake and oxLDL-induced apoptosis in macrophages with suppressed biosynthesis in atherosclerotic arteries

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**Objectives:** To test whether anti-inflammatory lipid mediator Lipoxin $A_4$ ($LXA_4$) can inhibit foam cell formation and macrophages apoptosis, and determine the circulating and local $LXA_4$ biosynthesis status in atherosclerosis.
**Methods:** Macrophages apoptosis was evaluated by TUNEL and Annexin V. Mitochondrial membrane potential was assayed by JC-1 Assay Kit. Serum and tissue levels of $LXA_4$ were assayed by ELISA kits.
**Results:** $LXA_4$ significantly suppressed cholesterol uptake genes CD36 and SR-A expression in a dose-dependent manner in THP-1 macrophages and human monocyte derived macrophages (from coronary artery disease patients), which could be abolished by $LXA_4$ receptor antagonist BOC-2. Furthermore, $LXA_4$ could inhibit oxLDL-induced CD36 upregulation. The uptake of Dil-oxLDL and Dil-acLDL as well as foam cell formation were inhibited under $LXA_4$ stimulation. It was observed that $LXA_4$ could reduce oxLDL-induced apoptosis in macrophages through inhibiting caspase-3 activation and restoring mitochondrial membrane potential. Moreover, cotreatment with $LXA_4$ significantly inhibited JNK pathway activated by ox-LDL. Circulating levels in stable coronary artery disease patients were much higher than that in nonobstructive patients. Local $LXA_4$ levels were lower but IFN-γ levels were higher in rabbit atherosclerotic vessel walls. In addition, in vitro experiment found that IFN-γ could suppress $LXA_4$ production in activated macrophages and foam cells.
**Conclusions:** $LXA_4$ could inhibit foam cell formation and oxLDL-induced apoptosis in macrophages. Increase of circulating $LXA_4$ and decrease of local $LXA_4$ were observed in atherosclerosis, which indicated that locally but not systematically inadequate production of resolution mediators might be the key reason in maintaining nonresolving inflammation in atherosclerosis.

### GW25-e5275

### Association between PPARγ Gene Polymorphism Haplotypes and Metabolic Syndrome in Chinese Population, Case-control and Family-based Study

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**Objectives:** We thought to evaluate the possible association between several polymorphisms in PPARγ gene and metabolic syndrome (MS), using two approaches, a case-control study and a family-based study.
**Methods:** Subjects and Measurements Subjects of 605 participated in the study. Case patients (of MS) of 94 and 131 control subjects participated in a case-control study. Family-based study included 149 probands and 231 siblings (from 90 families). BMI, fasting blood sugar (FBS), TC, TG, and HDL-c levels were measured. Genotyping We detected 7 polymorphisms of PPARγ gene, including two prevalence polymorphisms Pro12Ala (rs1801282) and C161T (rs3856806) and other five single-nucleotide polymorphisms (SNP): -553T/C (from the beginning of exon A2), -267T/A (from the beginning of exon A2), -628G/A (from the beginning of exon 1), rs7650213G/T, and rs13306747C/G, using a method of RFLP-PCR. Statistical Analysis Differences of quantitative traits were compared with one way ANOVA. SPSS software 13.0 was used. Pairwise linkage disequilibrium (LD) expressed in terms of D' and $r^2$ parameters and haplotype frequencies were estimated using the THESIAS program. A P value$<0.05$ was considered significant. The transmission of alleles to affected subjects with MS or unaffected subjects was analyzed using the transmission disequilibrium test (TDT) by TRANSMIT software. The proportion T of "overtransmitted" or "high-risk" alleles from informative parents was estimated by counting informative transmissions.
**Results:** Case-Control Study: No significant differences could be observed between the cases and controls of seven polymorphisms ($P>0.05$). Six common haplotypes were analyzed. The corresponding ORs of the MS for carriers of the rare allele versus homozygotes for the common allele of the seven polymorphisms varied from 0.26 to 0.74 (all $P>0.05$). A lower risk of the MS was observed of haplotype TTCGGCT versus common homozygote haplotype TTCGGCC. The TTCGGCT haplotype was lower frequent in MS patients than in control subjects. But it was not significant ($P=0.086$) .In pairwise linkage disequilibrium analysis, the polymorphism rs1801282 (all $D'>0.5$) and rs7650213 (all $D'>0.7$) were in linkage disequilibrium with other six polymorphisms.

Family-based Study: In TDT analysis of the pedigree of MS probands of seven polymorphisms, the patients were more likely to inherit the homozygotes of two polymorphisms, C allele (Pro) of rs1801282 and the C allele of rs3856806 ($P<0.05$). Similar results were not found in other five polymorphisms. There was a significant lower transmission of the haplotypes CTGGTCC ($P<0.05$) in haplotypes analysis of seven polymorphisms. Other haplotypes were not found overtransmitted or lower transmitted.
**Conclusions:** In case-control study, seven polymorphisms and their haplotypes of PPARγ are not associated with MS. While in family-based study, two polymorphisms of PPARγ gene, rs1801282 (Pro12Ala) and the rs3856806 (C161T) decrease the risk of the MS. And the haplotype CTGGTCC of seven polymorphisms can decrease the risk of MS in MS families. Therefore, PPARγ polymorphisms are associated with MS especially in families.

### GW25-e0242

### Urine may be a preferred source to generate induced pluripotent stem cell-derived cardiomyocytes for cardiac regenerative medicine

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**Objectives:** To test proof-of-principle if human iPSCs can be established by the transduction of transcription factors (Oc-t4, Sox-2, Klf-4, and c-Myc) into human adult urine cells and observe whether these iPSCs can be differentiated into cardiomyocytes.
**Methods:** We used directed differentiation protocols to derive cardiomyocytes using serum-free, chemically-defined media supplemented with BMP4, Activin A, bFGF, VEGF and DKK-1 in stage specific manner as previously described.
**Results:** In our study, positive results were obtained from the immunofluorescence staining of Oct-4, SSEA-4, Nanog, TRA-1-60 and alkaline phosphatase staining of our putative human iPS cells, which indicated that the reprogrammed human urine cells were expressing these typical embryonic stem cell (ESC) markers. The putative iPSCs were ESC-like and showed excellent differentiation potential into lineages derived from the primary three embryonic germ layers both in vitro and in vivo. Importantly, after cardiac differentiation from the above iPSCs, spontaneously beating outgrowths appeared approximately 14 to 21 days in embryoid bodies. Stable action potential (AP) recorded from spontaneously beating clusters and expression of the cardiac specific markers (troponin-T, α- actinin, MLC-2v, MLC-2a and HCN4) clearly confirmed the differentiation of iPSCs into cardiomyocyte in our study.
**Conclusions:** With these findings, we hypothesize that urine may be a preferred source in a totally noninvasive manner for generating iPS cell-derived cardiomyocytes for cardiac regenerative medicine.

### GW25-e0271

### The progress of cardiac stem cell study

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**Objectives:** At present the treatment of heart disease have much difficulty. The main causes are due to that drug therapy and percutanenus coronary intervention (PCI) or coronary artery bypass grafting (CABG) could not increase the number of cardiomyocytes, so the cardiac function does not enhanced much better. According to this, the numbers of cardiomyocytes is the key. In a single day the heart failure happens, both drug therapy and PCI can also not increase the number of cardiomyocytes and the heart function. With the development about stem cell researches, many studies have testified that transplanting of cardiac stem cells can enhanced the ejection fraction (HF) and cardiac function. The stem cell treatment outstandingly prolongs life-span and improves the prognosis of the patient suffering from heart failure
**Methods:** The paper summarized the recent results and clarified the kinds of cardiac stem cells. The paper overviews the method inducing stem cells into cardiomyocytes. It also shows the clinic works having been made about cardiac stem cells.
**Results:** All clinic studies have a significative conclusion increasing ejection fraction of heart. Through that it discusses the modifying technology regulating stem cells.
**Conclusions:** At last the article reveals the biological organ future of clinic transplantation.

### GW25-e0423

### MicroRNA-19b Acts as Potential Anti-thrombotic Protector in Coronary Artery Disease by Targeting Tissue Factor

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**Objectives:** Thrombosis plays a critical role in the pathogenesis of acute coronary events. Microparticles (MPs) are the major carrier of miRNAs in circulation. Tissue factor (TF), the initiator of extrinsic coagulation cascade, may be regulated by microRNAs (miRNAs). The aim of this study was to determine the potential role of miRNAs in regulating gene experession involved in thrombosis in coronary artery disease (CAD) .
**Methods:** MiRNA expression profiles in the plasma of patients with typical unstable angina (UA) and angiographically documented CAD compared with individuals with clinical suspicion of CAD but negative angiography were analyzed using Taqman low-density miRNA array. Levels of selected five miRNAs in plasma and plasma MPs were validated by real-time PCR. The characteristic of endothelial microparticles (EMPs) from plasma were analyzed by flow cytometry. In endothelial cells (ECs, EA.hy926 cells) and MPs releasd by ECs incubated with TNF-α, the levels of miR-19b were examined by real-time PCR. The target gene of miR-19b associated with thrombosis were pridicted by TargetScan and miRanda. Luciferase reporter assays were performed to confirm the binding of miR-19b to TF mRNA. TF expression induced by TNF-α in ECs was tested by real-time PCR. ECs were transfected with miR-19b mimic and the expression of TF were analyzed by real-time PCR and western blotting. Procoagulant activity of TF was analysed in miR-19b overexpressed ECs.
**Results:** Amomg 36 differential expressed miRNAs, miR-19b was the most obviously upregulated one. In UA patients, miR-19b level was upregulated in plasma

microparticles, and the amounts of EMPs from plasma were increased. In ECs, along with TF upregulation, miR-19b release and expression were increased stimulated by TNF-α. Luciferase reporter assays demonstrated that miR-19b bind to TF mRNA. Overexpression of miR-19b inhibited TF expression and procoagulant activity.
**Conclusions:** In UA patients, the increasement of miR-19b wrapped in EMPs for endothelial dysfunction may partialy contributed to the circulating miR-19b elevation. MiR-19b may play an anti-thrombotic role by inhibiting the expression of TF in ECs.

### GW25-e0833

### Acidic fibroblast growth factor promotes the function of endothelial progenitor cells through Akt/FOXO3a signaling pathway

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**Objectives:** Endothelial progenitor cells (EPCs) contribute to angiogenesis and acidic fibroblast growth factor (FGF1) gene transfer enhances EPC function. The Forkhead box O transcription factors (FOXOs) play an important role in the regulation of various cellular processes and EPCs mainly express FOXO3a. Here, we aimed to determine whether FGF1 promotes EPC function through Akt/FOXO3a signaling pathway.
**Methods:** EPCs were cultured from human peripheral blood and transduced with adenoviral vectors expressing a non-phosphorylatable, constitutively active mutant of FOXO3a (Ad-TM-FOXO3a) and the GFP transgene (Ad-GFP) used as control. The Ad-GFP group treated with FGF1 showed the functional improvement including cell survival, proliferation, migration and tube formation, whereas the above promoting effects were reversed after adding Akt inhibitor.
**Results:** The Ad-TM-FOXO3a group showed the reduced functionality compared with the control and failed to make the functional recovery after FGF1 treatment. Western blotting revealed that FGF1 made EPC functional enhancement through upregulating the phosphorylation of Akt and FOXO3a which could be suppressed by Akt inhibitor.
Conversely, FGF1 failed to rescue EPCs transduced with Ad-TM-FOXO3a from dys-function because the mutant FOXO3a were not phosphorylated by Akt.
**Conclusions:** FGF1 promoting EPC function is mediated through Akt/FOXO3a signaling pathway. The molecular mechanism of EPC functional improvement we initially explored may provide new ideas for the future to enhance the EPC angiogenic effect and optimize the EPC transplantation therapy.

### GW25-e1550

### Altered Serum MicroRNAs as Novel Diagnostic Biomarkers for Atypical Coronary Artery Disease

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**Objectives:** Atypical coronary artery disease (ACAD) is characterized by atypical angina pectoris or silent myocardial ischemia. However, conventional diagnostic techniques are insufficient to identify this subtype of coronary atherosclerotic pathology, and specific and sensitive markers for diagnosing ACAD are still currently lacking. The aim of the present study is to identify a novel serum miRNA expression profile of ACAD patients and evaluate its clinical diagnostic value.
**Methods:** We enrolled 122 patients who were diagnosed with ACAD and 44 age-matched controls in this study. We examined the levels of a subset of serum miRNAs in both ACAD and control samples. In addition, we sought to predict the potential target genes of the altered miRNAs using bioinformatics methods.
**Results:** By using TaqMan low density array technology followed by confirmation with quantitative real-time PCR (qRT-PCR), we identified four miRNAs including miR-487a, miR-502, miR-208 and miR-215 that were significantly increased, and one miRNA, miR-29b which was significantly decreased in ACAD patients compared with normal subjects ($P< 0.05$). The area under the ROC curve (AUC) for the five miRNAs ranged from 0.670 to 0.876 ($P< 0.05$), and their panel (0.885) was significantly higher than that of hsTnI (0.627). In addition, target gene prediction showed that these five altered miRNAs are involved in affecting various aspects of cardiac or vascular remodeling, especially in the pathway involving inflammation and fibrosis.
**Conclusions:** Our findings indicate that the five altered serum miRNAs could be novel non-invasive biomarkers for ACAD and may also represent potential therapeutic targets for atherosclerosis and myocardial ischemia.

### GW25-e1723

### Protective effects and mechanism of trimetazidine on myocardial structure damaged by pyran adriamycin

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**Objectives:** To explor the effects of trimetazidine on myocardial structure damaged by pyran adriamycin and to clarify the protection and mechanism of trimetazidine on damaged myocardial structure induced by pyran adriamycin**.**
**Methods:** 36 Wistar rats were randomly divided into control group, model group and treatment group. Rats in model group and treatment group were injected pyran doxorubicin 2.5mg/kg (concentration 2mg/ml) by the vena caudal once a week. Control group were injected equivalent normal saline in a coordinative control for 6 weeks. Rats in treatment group were intragastric infuse trimetazidine 5.4mg/kg/d one day before making the model. Control group, model group were injected equivalent normal saline in a coordinative control for 8 weeks. At the end of the experiment, index of heart mass of rats and myocardial enzymes of serum were measured. Systolic and diastolic function were detected with echocardiography. The myocardium tissue were detected by light microscope and electron microscope.
**Results:** Compared with model group, the level of myoglobin, troponin and alanine transaminase (ALT) in treatment group were decreased ($P<0.05$). Index of heart mass in treatment group is lower than that in model group and nearly the level of control group. Compared with control group, EF and FS in model group decreased ($P<0.01$) and LVIDD, LVIDS in creased ($P<0.05$). EF and FS in Group C is larger than that in Group B ($P<0.05$), LVIDS, LVIDD in treatment group is lower than model group ($P<0.05$). Under the light microscope observation, in model group myocardial arranged disorderly, severely damaged structure, multiple visibl emyocardial, myofilament dissolved, fracture, while in treatment group myocardial arranged in order, structure was nearly integrated, partial dissolution, fracture. Under the electron microscope observation, in model group myocardial muscle bundle dissolved fractured, disappeared, mitochondria decreased, cytoplasmic matrix cavitation, while in treatment group, arrangement of cardio myocytes sarcomeres in tow, local myofilaments reduced slightly, surrounding mitochondria were oval and arranged in parallel between the muscle bundles.
**Conclusions:** Trimetazidine can protect the damaged cardiomyocytes and improve the cardiac function caused by pyran adriamycin, and its mechanism may be related to decrease the injury of mitochondria and myocytes

### GW25-e3154

### Prognostic Value of Mean Platelet Volume to Platelet Count Ratio and White Blood Cell Count in Predicting the Survival in Acute Aortic Dissection

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**Objectives:** Recent evidence indicates that platelet indices and white blood cell (WBC) are associated with the prognosis of patients with acute aortic dissection (AD). However, there have been no systematic investigations on the utility of baseline mean platelet volume (MPV) to platelet count (PC) ratio (MPV/PC ratio) and WBC for predicting the survival of acute AD. The present study was designed to examine whether the MPV/PC ratio and WBC could predict mortality in acute AD
**Methods:** Baseline clinical details and hematologic parameters were obtained prospectively in 272 acute AD patients consecutively admitted to a single medical center. The levels of MPV, PC and WBC were determined after their initial admission and evaluated, in concert with follow-up patient survival data, to determine if the MPV/PC ratio and WBC could predict mortality. Between initial measurement and follow-up (medium time: 570 (11-1222.5) days)
**Results:** Increased levels of plasma MPV/PC ratio (6.3513 (4.6439-8.8730) versus 5.3939 (4.068-6.7415), $P<0.001$) and WBC (11.90 (8.85-16.03) vs 9.91 (7.46-13.05), $P<0.001$) were found in dead patients compared with those survived during the follow-up. Multivariable analysis showed that MPV/PC ratio (P=0.014, OR=1.179, 95% CI: 1.034 to 1.344) and WBC (P=0.011, OR=1.106, 95% CI: 1.024 to 1.195) was an independent predictor for all-cause mortality during follow-up, respectively. The areas under receiver operating characteristic (ROC) curves of MPV/PC ratio and WBC were 0.618 (95% CI: 0.542 to 0.694) and 0.625 (95% CI: 0.553 to 0.698) for predicting follow-up mortality, with a sensitivity of 39.8%, specificity of 88.1%, cut-off value of $7.55197\times102$fL/(109/L) and a sensitivity of 52.7%, specificity of 68.9%, cut-off value of $11.53\times10^9$/L, respectively, While the areas under ROC curves of combination WBC and MPV/PC ratio was 0.674 (95% CI: 0.603 to 0.745) with a sensitivity of 39.8%, specificity of 88.1%. Kaplan-Meier analysis and log-rank test revealed significant survival differences between patients with a MPV/PC ratio $<7.55197\times10^2$fL/ ($10^9$/L) and a MPV/PC ratio $\geq7.55197\times10^2$fL/ ($10^9$/L) ($P<0.001$) *and with* a WBC $<11.53\times10^9$/L and a WBC $\geq11.53\times10^9$/L ($P<0.001$). Subgroup analysis showed MPV/PC ratio had prognostic value for mortality in patients with type A ($P<0.001$), surgery (P= 0.007) and only medication treatment ($P<0.001$), no predictive value were found in patients with type B (P=0.410) and endovascular treatment (P= 0.822) patients, while prognostic value of WBC for mortality was found in patients with type A (P=0.004) and only medication treatment (P=0.004).
**Conclusions:** the elevated MPV/PC ratio and WBC were important risk factors and independently associated with mortality of patients with acute AD. These patients may benefit more from surgical intervention and endovascular treatment.

### GW25-e3180

### Berberine attenuates cardiac dysfunction, fibrosis, inflammatory in diabetic cardiomyopathy

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